

## JAPANESE COMMENTS ON US PROPOSAL OF INF.DOC.NO.6( 45<sup>TH</sup> GRRF)

### PURPOSE

US proposed to maintain the harmonization of EV requirement between R13H and FMVSS135 at last 45<sup>th</sup> GRRF.

We investigated the difference between R13H and FMVSS135 and made the comments for the harmonization of EV requirement.

We think that this will contribute the discussion for harmonization of EV requirement.

### **Comparison of FMVSS 135 and ECE R13H Concerning Electric Vehicle Requirement**

No.	Paragraph	FMVSS 135	Paragraph	R13H	Comments
		Original text		Original text	
1	S4	<i>Electric vehicle or EV</i> means a motor vehicle that is powered by an electric motor drawing current from rechargeable storage batteries, fuel cells, or other portable sources of electrical current, and which may include a non-electrical source of power designed to charge batteries and components thereof.	2.17	" <i>Electric vehicle</i> " means a vehicle in which the traction is effected <b>only</b> by (an) electric motor(s) acting at least on one axle;	<p><b>The Definition of Electric Vehicles</b></p> <p>Considering the state of the art, it is better to include hybrid vehicles in the regulation. The definition of electric vehicles of FMVSS 135 can be interpreted as including hybrid vehicles already. GRRF is now discussing the expansion of EV requirement in ECE R13 to cover hybrid vehicles. The word "<b>only</b>" in the left paragraph in R13H should be deleted.</p>
2		<i>Maximum speed of a vehicle or VMax</i> means the highest speed attainable by accelerating at a maximum rate from a standing start for a distance of 3.2 km (2 miles) on a level surface, with the vehicle at its lightly loaded vehicle weight, and, if an EV, with the propulsion batteries at a state of charge of not less than 95% at the beginning of the run.		No prescription in R13H  Ref. In ECE R68,it is prescribed to charge to the SOC recommended by vehicle manufacturer.	<p><b>SOC Requirement Concerning The Maximum Speed Of Electric Vehicles</b></p> <p>From the same reason as no.1, FMVSS 135 should include hybrid vehicles in its SOC requirements.</p> <p>Example -- The following sentence may be added to the left FMVSS paragraph. "For a hybrid vehicle, VMax means the highest speed attainable with the propulsion batteries at the state of charge yielding the highest speed (e.g., the value of state of charge resulting from automatic vehicle adjustment or the value recommended by the vehicle manufacturer or a value not less than 95%)."</p> <p>The difference concerning the provision of maximum speed between FMVSS 135 and ECE R13H seems to be caused by the different certification system.</p>
3	S5,13	(a) <i>For an EV equipped with RBS</i> , the RBS is considered to be part of the service brake system if it is automatically activated by an application of the service brake control, if there is no means provided for the driver to disconnect or otherwise deactivate it, and if it is activated in all transmission positions, including neutral.	2. 1 7.3.  2.17.4	2.17.3. " <i>Electric regenerative braking system of category A</i> " means an electric regenerative braking system which is not part of the service braking system; 2.17.4. " <i>Electric regenerative braking system of category B</i> " means an electric regenerative braking system which is part of the service braking system;	<p><b>The Definition Of Regenerative Braking System</b></p> <p>The definition of "part of the service brake system" in FMVSS 135 is better to be harmonized to the definition in ECE R13H. definition of ERB is quite different between two regulations. concerning RBS ,FMVSS 135 and ECE R13H also have two categories. one is "part of the service brake system" and the other is "not part of the service brake system". the definition is different between ECE and FMVSS. according to the FMVSS 135 categorization, most of the ordinary RBS can be considered to be "not part of the service brake system". FMVSS135, RBS with having the disconnection mode or so is not deemed as "part of the service braking system". means that if vehicle behavior may be affected by the operation of the RBS which is "not part of the service brake system", the requirement for the service braking system is not adopted to it . In ECE R13H,the same system is deemed as "part of the service braking system" and prescribe the permissible condition of disconnection and also require to meet other provisions as the service braking system including additional requirement. more appropriate to associate the braking force generated by brake pedal operation with the service brake system .</p> <p>Reference No.4,No.11,No.13,No.16</p>

			<p>5. 2. 18</p> <p>5.2.18.1.1. the electric regenerative braking shall only be activated by the accelerator control and/or the gear neutral position.</p> <p>5.2.18.2. Electric vehicles fitted with an electric regenerative braking system of category B;</p> <p>5.2.18.2.1. it must not be possible to disconnect partially or totally one part of the service braking system other than by an automatic device;</p> <p>5.2.18.2.2. the service braking system must have only one control device;</p> <p>5.2.18.2.3. the service braking system must not be adversely affected by the disengagement of the motor(s) or by the gear ratio used;</p> <p>5.2.18.3. For electric vehicles fitted with an electric regenerative braking system of both categories, all the relevant prescriptions shall apply except paragraph 5.2.18.1.1. above. In this case, the electric regenerative braking may be actuated by the accelerator control and/or the gear neutral position. Additionally, the action on the service braking control must not reduce the above braking effect generated by the release of the accelerator control;</p>																																		
4		<p><b>(b) For an EV that is equipped with both ABS and RBS that is part of the service brake system, the ABS must control the RBS.</b></p>	<p>5.2.18.5. For vehicles equipped with an anti-lock device, the anti-lock device must control the electric braking system.</p>	<p><b>Vehicle Behavior Check For Category A</b></p> <p>ECE R13H in its Annex 3 1.2.9 provides a vehicle behavior test for an electric regenerative braking system of category A. And category A is a kind of the engine brake for ICE and engine brake is not controlled by ABS. For this reason, the design requirement that ABS must control RBS does not seem to be necessary and it will be better to be harmonized to FMVSS 135, which does not provide such a requirement for category A. On the other hand, FMVSS 135 needs a vehicle behavior test for category A.</p> <table border="1" data-bbox="1368 1465 2724 1915"> <thead> <tr> <th colspan="2" rowspan="2">Vehicle behavior check method</th> <th colspan="2">FMVSS 135</th> <th colspan="2">R13H</th> </tr> <tr> <th>RBS control by ABS</th> <th>Behavior check test</th> <th>RBS control by ABS</th> <th>Behavior check test</th> </tr> </thead> <tbody> <tr> <td rowspan="2">System</td> <td>Category A</td> <td>With ABS</td> <td><i>not required</i></td> <td rowspan="2"><i>No test</i></td> <td rowspan="2"><i>Required</i></td> <td rowspan="2">Prescribed in Annex 3 1.2.9.1</td> </tr> <tr> <td>Not part of service brake system</td> <td>Without ABS</td> <td>_____</td> </tr> <tr> <td rowspan="2">System</td> <td>Category B</td> <td>With ABS</td> <td><i>required</i></td> <td>Assurance by ABS</td> <td><i>required</i></td> <td>Prescribed in Annex 3 1.2.9.1, Annex 6</td> </tr> <tr> <td>Part of service brake system</td> <td>Without ABS</td> <td>_____</td> <td>Prescribed in S6.5.4.2</td> <td>_____</td> <td>Prescribed in Annex 3 Annex 5.3.2.3</td> </tr> </tbody> </table> <p>*</p>	Vehicle behavior check method		FMVSS 135		R13H		RBS control by ABS	Behavior check test	RBS control by ABS	Behavior check test	System	Category A	With ABS	<i>not required</i>	<i>No test</i>	<i>Required</i>	Prescribed in Annex 3 1.2.9.1	Not part of service brake system	Without ABS	_____	System	Category B	With ABS	<i>required</i>	Assurance by ABS	<i>required</i>	Prescribed in Annex 3 1.2.9.1, Annex 6	Part of service brake system	Without ABS	_____	Prescribed in S6.5.4.2	_____	Prescribed in Annex 3 Annex 5.3.2.3
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5	S5.5.1	<p><b>US PROPOSAL</b></p> <p>S5.5.5(d)(6)  (f) For a vehicle with electric transmission of the service brake control signal, failure of a brake control circuit.</p>	5.2.21.	<p>Brake failure and defect warning signals (general requirements):  5.2.21.1. Motor vehicles shall be capable of providing optical brake failure and defect warning signals, as follows;</p>	<p><b>RBS Warning Indicator</b></p> <p>S5.5.5(d)(6)  The FMVSS135 requires specific RBS warning indicator. ECE R13H does not require.  It is desirable to have the same color and same indication for this warning signal between FMVSS 135 and ECE R13H.  But it is not only the case limited to RBS indicator requirement but also the case to general indicator requirement.</p>
6		<p>(g) For an EV with a regenerative braking system that is part of the service brake system, failure of the RBS. An amber lamp may be used displaying the symbol "RBS."  RBS failure in a system that is part of the service brake system may also be indicated by an amber lamp that also indicates ABS failure and displays the symbol "ABS/RBS".</p>	5.2.21.1.1.	<p>5.2.21.1.1. A red warning signal, indicating a failure within the vehicle braking equipment which precludes achievement of the prescribed service braking performance and/or which precludes the functioning of at least one of two independent service braking circuits;  5.2.21.1.2. Where applicable, a yellow warning signal indicating an electrically detected defect within the vehicle braking equipment, which is not indicated by the red warning signal described in paragraph 5.2.21.1.1. above.</p>	
			5.2.18.2.4.	<p>if the operation of the electric component of braking is ensured by a relation established between information coming from the control of the service brake and the braking force to the wheels which of it results, a failure of this relation leading to the non-respect of the prescriptions of distributor of braking among the axles (annex 5 or 6, which is applicable) must be warned to the driver by an optical warning signal at the latest when the control is actuated and having to remain lit as long as this defect exists and that the switch of "contact" is in the position "go".</p>	

	S6.3.11.1	<p><b>US PROPOSAL</b></p> <p>The state of charge of the propulsion batteries is determined in accordance with SAE Recommended Practice J227a, <i>Electric Vehicle Test Procedure</i>, February 1976. The applicable sections of J227a are 3.2.1 through 3.2.4, 3.3.1 through 3.3.2.2, 3.4.1 and 3.4.2, 4.2.1, 5.2, 5.2.1 and 5.3.</p>	2.17.5	<p>"<i>Electric state of charge</i>" means the instantaneous ratio of electric quantity of energy stored in the traction battery relative to the maximum quantity of electric energy which could be stored in this battery;</p>	<p><b>SOC Condition</b></p> <p>FMVSS 135 specifies the ratio of electric energy stored in a battery at the beginning and during a test. ECE R13H defines only the ratio of stored electric energy, and lacks the specification of a ratio during a test. This disagreement between the two regulations will be come from the different certification systems between ECE and FMVSS. ECE R13H will permit technical services to exercise their judgment on a required ratio during a test.</p>
8	S6.3.11.2	<p><b>US PROPOSAL</b></p> <p>At the beginning of the burnish procedure (S7.1. of this standard) in the test sequence, each propulsion battery is at the maximum state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, of, if the manufacturer has made no recommendation, not less than 95%. During the 200-stop burnish procedure, the propulsion batteries are restored to the maximum state of charge determined as above, after each increment of 40 burnish stops until the burnish procedure is complete. The batteries may be charged at a more frequent interval during a particular 40-stop increment only if the EV is incapable of achieving the initial burnish test speed during that increment. During the burnish procedure, the propulsion batteries may be charged by external means or replaced by batteries that are at a state of charge of not less than 95%. For an EV having a manual control for setting the level of regenerative braking, the manual control, at the beginning of the burnish procedure, is set to provide maximum regenerative braking throughout the burnish.</p>			<p><b>SOC Condition During The Burnish</b></p> <p>The FMVSS-135 is necessary to include requirements concerning the state of charge of a battery for a hybrid vehicle from the same reason as No.1. The following requirement may be added:</p> <div data-bbox="1409 829 2715 976" style="border: 1px solid black; padding: 5px;"> <p>For a hybrid vehicle, the SOC value at the beginning of the burnish procedure may be set at the value Example resulting from automatic vehicle adjustment or the value recommended by the vehicle manufacturer or a value not less than 95%" so that the maximum work of an RBS will be attainable.</p> </div> <p>ECE R13H has not the burnish procedure because of the different certification systems from FMVSS.</p>

9	S6.3.11.3.	<p><b>US PROPOSAL</b></p> <p>At the beginning of each performance test in the test sequence (S7.2. through S7.17. of this standard), unless otherwise specified, an EV's propulsion batteries are at the state of charge recommended by the manufacturer, as stated in the vehicle operator's manual or on a label that is permanently attached to the vehicle, or, if the manufacturer has made no recommendation, at a state of charge of not less than 95%. No further charging of any propulsion battery occurs during any of the performance tests in the test sequence of this standard. If the propulsion batteries are depleted during a test sequence such that the vehicle reaches automatic shut-down, will not accelerate, or the low state of charge brake warning lamp is illuminated, the vehicle is to be accelerated to brake test speed by auxiliary means. If a battery is replaced rather than recharged, the replacement battery shall be charged and measured for state of charge in accordance with these procedures.</p>	Annex3 1.5 1.5.1. 1.5.1.6	<p><b>Type-I test</b> <i>(fade and recovery test)</i></p> <p><b>Heating performance</b></p> <p>For electric vehicles not having a sufficient autonomy to carry out the cycles of heating, the tests shall be carried out by respecting speed during the first braking application then by using the maximum acceleration of the vehicle, and brake successively at the speed reached at the end of each 45 seconds cycle duration.</p>	<p><b>SOC Condition During Test</b></p> <p>The FMVSS-135 is necessary to include requirements concerning the state of charge of a battery at the beginning of a test for a hybrid vehicle.</p> <p>The following requirement may be added</p> <p>For a hybrid vehicle, the SOC value may be set at the value resulting from automatic vehicle adjustment or the value recommended by the vehicle manufacturer or a value not less than 95%.</p>
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10	S6.3.12	<p><b>US PROPOSAL</b></p> <p><i>State of charge of batteries for electrically-actuated service brakes.</i></p> <p>A vehicle equipped with electrically-actuated service brakes also performs the following test series. Conduct 10 stopping tests from a speed of 100kph or the maximum vehicle speed, whichever is less. At least two of the 10 stopping distances must be less than or equal to 70m. The vehicle is loaded to GVWR and the transmission is in the neutral position when the service brake control is actuated and throughout the remainder of the test. Each battery providing power to the electrically-actuated service brakes, shall be in a depleted state of charge for conditions (a), (b), or (c) of this paragraph as appropriate. An auxiliary means may be used to accelerate an EV to test speed.</p> <p>(a) For an EV equipped with electrically-actuated service brakes deriving power from the propulsion batteries and with automatic shut-down capability of the propulsion motor(s), the propulsion batteries are at not more than 5% above the EV actual automatic shut-down critical value. The critical value is determined by measuring the state-of-charge of each propulsion battery at the instant that automatic shut-down occurs.</p> <p>(b) For an EV equipped with electrically-actuated service brakes deriving power from the propulsion batteries and with no automatic shut-down capability of the propulsion motor(s), the propulsion batteries are at an average of not more than 5% above the actual state of charge at which the brake failure warning signal, required by S5.5.1(e) of this standard, is illuminated.</p> <p>(c) For a vehicle which has one or more auxiliary batteries that provides electrical energy to operate the electrically-actuated service brakes, each auxiliary battery is at not more than 5% above the actual state of charge at which the brake failure warning signal, required by S5.5.1(e) of this standard, is illuminated.</p>	<p>5.</p> <p>2.</p> <p>20</p> <p>5.2.20.1</p> <p>Special additional requirements for service braking systems with electric control transmission:</p> <p>5.2.20.1. With the parking brake released, the service braking system shall be able to generate a static total braking force at least equivalent to that produced during the Type-0 test, even when the ignition/start switch has been switched off and/or the key has been removed. It should be understood that sufficient energy is available in the energy transmission of the service braking system;</p>	<p><b>SOC condition for Electro Mechanical Brake</b></p> <p>The system shown left in FMVSS135 is concerned about a service brake system which is different from the system prescribed in ECE R13H.</p> <p>FMVSS 135 primarily concerns brakes like EMB (Electro mechanical brake), while ECE R13H mainly pertains to hydraulic brakes with electric control transmission.</p> <p>From the standpoint of RBS, it is not necessary to achieve conformity between the two regulations. It is necessary to discuss whether ECE R13H adds the detailed provision like FMVSS135 concerning EMB or not. The provisions shown left in R13H is concerned about EBS.</p> <p>ECE R13H needs clarification as to whether RBS are included in its paragraph 5.2.20.</p>
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11	S6.3.13.1	<p><b>US PROPOSAL</b></p> <p>(a) For an EV equipped with an RBS that is part of the service brake system, the RBS is operational during the burnish and all tests, except for the test of a failed RBS.</p> <p>(b) For an EV equipped with an RBS that is not part of the service brake system, the RBS is operational and set to produce the maximum regenerative braking effect during the burnish, and is disabled during the test procedures. If the vehicle is equipped with a neutral gear that automatically disables the RBS, the test procedures which are designated to be conducted in gear may be conducted in neutral.</p>	5.2 18.3	<p>For electric vehicles fitted with an electric regenerative braking system of both categories, all the relevant prescriptions shall apply except paragraph 5.2.18.1.1. above. In this case, the electric regenerative braking may be actuated by the accelerator control and/or the gear neutral position. Additionally, the action on the service braking control must not reduce the above braking effect generated by the release of the accelerator control;</p>	<p><b>RBS Operation Mode During Test</b></p> <p>The operation mode of RBS of category A and B required during the tests is different .</p> <p>But most of this difference will be harmonized when the proposal No.4(The definition of part of the service braking system) is agreed.</p> <p>At that time, the items (a) and (b) in the left-hand column are not necessary and should be deleted to solve the following disagreement.</p> <p>If (a) and (b) of FMVSS135 remain, it make some disagreement as follows.</p> <ol style="list-style-type: none"> <li>1) For (a), the RBS of category B which does not operate in neutral should be forced to operate in neutral.</li> <li>2) For (b), the RBS of category B should be inhibited to operate in order to inhibit the RBS of category A by shifting to neutral.</li> <li>3) For (b), the RBS of category A which operate in neutral should be inhibited.</li> </ol>
			Annex 3 1.2.9	<p>for electric vehicles as described in paragraph 1.2.8., fitted with an electric regenerative braking system of category A, behaviour tests defined in paragraph 1.4.3.1. of this annex shall be carried out on a track with a low adhesion coefficient (as defined in paragraph 5.2.2. of annex 6);</p>	<p><b>Vehicle Behavior Check For Category A</b></p> <p>The tests prescribed in FMVSS 135 do not include the check of vehicle behavior for an RBS that is “ not part of the service brake system”. The vehicle behavior checking test should be added to FMVSS 135 like ECE R13H.</p> <p>* Refer to Table 1 of No,4.</p>
12	S7.7.3	<p><b>US PROPOSAL</b></p> <p><i>Stops with Engine Off.</i></p> <p>(h) For an EV, this test is conducted with no electromotive force applied to the vehicle propulsion motor(s), but with brake power or power assist still operating, unless cutting off the propulsion motor(s) also disables those systems.</p>	5.2.15	<p>Without prejudice to the requirements of paragraph 5.1.2.3. above, where an auxiliary source of energy is essential to the functioning of a braking system, the reserve of energy must be such as to ensure chat, if the engine stops or in the event of a failure of the means by which the energy source is driven, the braking performance remains adequate to bring the vehicle to a halt in the prescribed conditions. In addition, if the muscular effort applied by the driver to the parking braking system is reinforced by a servo device, the actuation of parking braking must be ensured in the event of a failure of the servo device, if necessary by using a reserve of energy independent of that normally supplying the servo device. This reserve of energy may be that intended for the service braking system.</p>	<p><b>Stopping Test With Engine Off</b></p> <p>The current FMVSS 135 (S7.7.3) is practically identical with ECE R13H, except that ECE R13H provides static requirements for EBS (para.5.2.20.1).</p> <p>The provisions proposed in Informal Document No.6 are different from those in the current FMVSS 135,. The proposal seems to permit the braking system of which the braking force becomes less than the prescribed level when engine off provided a red warning lamp is turned on. It seems to be concerned to the fundamental philosophy.</p> <p>Concerning the RBS warning lamp , same as No.6.</p>

			5.2.20.1	5.2.20. Special additional requirements for service braking systems with electric control transmission: 5.2.20.1. With the parking brake released, the service braking system shall be able to generate a static total braking force at least equivalent to that produced during the Type-0 test, even when the ignition/start switch has been switched off and/or the key has been removed. It should be understood that sufficient energy is available in the energy transmission of the service braking system;	
13	S7.10.3.	<b>US PROPOSAL</b>  <i>Hydraulic circuit failure.</i> (f) Alter the service brake system to produce any single failure. For a hydraulic circuit, this may be any single rupture or leakage type failure, other than a structural failure of a housing that is common to two or more subsystems. For a vehicle in which the brake signal is transmitted electrically between the brake pedal and some or all of the foundation brakes, regardless of the means of actuation of the foundation brakes, this may be any single failure in any circuit that electrically transmits the brake signal. For an EV with RBS that is part of the service brake system, this may be any single failure in the RBS.	2.2.4  2.2.4.1.  2.2.4.2.	For the electric vehicles, the performances for two following additional failures will be checked: 2.2.4.1. For a total failure of the electric component of the service brake; 2.2.4.2. In the case where the electric component delivers the maximum braking force where a failure of the electric transmission occurs.	<b>Failure Mode Test</b>  There are difference between FMVSS 135 and ECE R13H with regard to the check of performances at failed condition. However, since these difference comes from the different certification systems , it seems to be difficult that the FMVSS 135 has the same contents as ECE R13H (2.2.4.2 , 5.2.9)  This item (electric component failure) does not apply to the ordinary RBS under the current FMVSS 135. Because the ordinary RBS is not deemed as “a part of the service brake system” in present FMVSS135 (for reference No 4).
			5.2.9	5.2.9. Malfunctions of the electric control transmission shall not apply the brakes contrary to the driver’s intentions.	
14	S7.12.2	<b>US PROPOSAL</b>  <i>S7.12. Parking brake.</i> (i) For a vehicle equipped with mechanically-applied parking brakes, make a single application of the parking brake control with a force not exceeding the limits specified in S7.12.2.(b). For a vehicle using an electrically-activated parking brake, apply the parking brake by activating the parking brake control.	5.2.19.2	In the case of a break in the wiring within the electric control transmission, it shall remain possible to apply the parking braking system from the driver’s seat and achieve the parking braking performance specified in paragraph 2.3.1. of annex 3 to this Regulation. It shall also be possible to release the parking braking. system, if necessary by the use of an auxiliary release device carried/fitted on the vehicle.	<b>EPB Requirement</b>  GRRF is now discussing requirements for electrically-activated parking brakes in the cases of ignition off and failure mode. The agreed contents of this discussion should be introduced into FMVSS 135.



15	S7.13  S6.3.13.1	<p><b>US PROPOSAL</b></p> <p><i>Heating Snubs.</i> The purpose of the snubs is to heat up the brakes in preparation for the hot performance test which follows immediately.</p> <p>(a) For an EV equipped with an RBS that is part of the service brake system, the RBS is operational during the burnish and all tests, except for the test of a failed RBS.</p> <p>(b) For an EV equipped with an RBS that is not part of the service brake system, the RBS is operational and set to produce the maximum regenerative braking effect during the burnish, and is disabled during the test procedures. If the vehicle is equipped with a neutral gear that automatically disables the RBS, the test procedures which are designated to be conducted in gear may be conducted in neutral.</p>	Annex3 1.5.1.6  Annex3 1.5.1.4.	<p>Type-I test (fade and recovery test)</p> <p>1.5.1. Heating procedure</p> <p>1.5.1.6. For electric vehicles not having a sufficient autonomy to carry out the cycles of heating, the tests shall be carried out by respecting speed during the first braking application then by using the maximum acceleration of the vehicle, and brake successively at the speed reached at the end of each 45 seconds cycle duration.</p> <p>1.5.1.4. During brake applications, the highest gear ratio (excluding overdrive, etc.) must be continuously engaged.</p>	<p><b>Fade Heating Procedure</b></p> <p>The test procedure which is prescribed in ECE R13H is more practical than the one in FMVSS 135 with regard to usage conditions of RBS and methodology. As for heating procedure, FMVSS 135 should be harmonized to ECE R13H permitting the operation of RBS at heating snubs as ECE R13H.</p> <p>FMVSS 135 should adopt a phrase accounting for vehicle autonomy as in ECE.</p>
16	S7.14.1.	<p><b>US PROPOSAL</b></p> <p><i>Hot performance.</i> The hot performance test is conducted immediately after completion of the 15<sup>th</sup> heating snub.</p>	Annex 3 1.5.2.5  Annex 3 1.5.2.3	<p>In the case of the electric vehicles having carried out the cycles of heating, according to paragraph 1.5.1.6. of the present annex, the performance tests shall be carried out at the maximum possible speed by the vehicle at the end of the cycles of heating. For comparison, the performance of the Type-0, brakes cold, will be repeated at this same speed after reconditioning of the linings.</p> <p>For electric vehicles fitted with an electric regenerative braking system of category A, during brake applications, the highest gear must be continuously engaged and the separate electric braking control, if any, not used.</p>	<p><b>Hot Performance Test</b></p> <p>ECE R13H permits the operation of RBS of category A, while FMVSS 135 does not. ECE R13H is more practical, and FMVSS 135 should permit the operation of RBS of category A which operates in the neutral gear.</p> <p>However in the case of hot performance, the braking test is performed under the neutral gear position. At that case the ordinary RBS will not be activated in practical.</p>